

# An early breakfast may reduce the risk of developing type 2 diabetes

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Eating breakfast after 9 a.m. is associated with a 59% higher risk of

developing type 2 diabetes compared to risk in people who eat breakfast before 8 a.m. This is the main conclusion of a study in which ISGlobal, an institution supported by "la Caixa" Foundation, took part. The study followed more than 100,000 participants in a French cohort. The results show that we can reduce the risk of diabetes not only by changing what we eat, but also when we eat it.

The work is published in the *International Journal of Epidemiology*.

Type 2 [diabetes](#) is associated with [modifiable risk factors](#), such as an unhealthy diet, physical inactivity and smoking. But another factor may be important: the time at which we eat. "We know that meal timing plays a key role in regulating circadian rhythms and glucose and lipid control, but few studies have investigated the relationship between meal timing or fasting and type 2 diabetes," says Anna Palomar-Cros, ISGlobal researcher and first author of the study.

In this study, a team from ISGlobal joined a team from INSERM in France to investigate the association between meal frequency and timing and the incidence of type 2 diabetes among 103,312 adults (79% women) from the French NutriNet-Santé cohort.

Participants filled in online dietary records of what they ate and drank over a 24-hour period on 3 non-consecutive days, as well as the timing of their meals. The research team averaged the dietary records for the first two years of follow-up and assessed the participants' health over the following years (an average of seven years).

## **Early breakfast, early dinner**

There were 963 new cases of type 2 diabetes during the study. The risk of developing the disease was significantly higher in the group of people who regularly ate [breakfast](#) after 9 a.m., compared to those who ate

breakfast before 8 a.m.

"Biologically, this makes sense, as skipping breakfast is known to affect glucose and lipid control, as well as insulin levels," explains Palomar-Cros. "This is consistent with two [meta-analyses](#) that conclude that skipping breakfast increases the risk of type 2 diabetes," Palomar-Cros adds.

The research team also found that a late dinner (after 10 p.m.) seemed to increase the risk, while eating more frequently (about five times a day) was associated with a lower disease incidence. In contrast, prolonged fasting is only beneficial if it is done by having an early breakfast (before 8 a.m.) and an early dinner.

"Our results suggest that a first meal before 8 a.m. and a last meal before 7 p.m. may help reduce the incidence of type 2 diabetes," concludes Manolis Kogevinas, ISGlobal researcher and co-author of the study. In fact, the same ISGlobal team had already provided evidence on the [association between an early dinner and a lower risk of breast or prostate cancer](#).

Taken together, these results consolidate the use of chrononutrition (i.e. the association between diet, [circadian rhythms](#) and health) to prevent type 2 diabetes and other chronic diseases.

**More information:** Anna Palomar-Cros et al, Associations of meal timing, number of eating occasions and night-time fasting duration with incidence of type 2 diabetes in the NutriNet-Santé cohort, *International Journal of Epidemiology* (2023). [DOI: 10.1093/ije/dyad081](https://doi.org/10.1093/ije/dyad081)

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